III. *On some alvine concretions found in the colon of a young man in Lancashire, after death. By* J. G. CHILDREN, *Esq. F. R. S. &c. &c. Communicated by the Society for Promoting Animal Chemistry.*

Read December 13, 1821.

I WAS furnished with the particulars of the following case, through the kindness of JAMES THOMSON, Esq. of Primrose, near Clitheroe.

JOHN CHAMBERS, aged 19, a carpenter at Clitheroe, in Lancashire, was in the habit, during the hot weather of July 1814, of refreshing himself whilst at work, by eating a quantity of unripe plums, of which, at various times, he ate several quarts, and generally swallowed the stones, under the erroneous notion entertained by the lower classes in that neighbourhood, that they would assist the digestion of the fruit. A fellow workman of CHAMBERS, aged 30, pursued the same practice with impunity. Not so the unfortunate subject of this communication, who about Christmas began to complain, but still pursued his occupation and worked, with some interruption, till February 1815, when he applied to Mr. COULTATE, of Clitheroe, for advice, complaining of pain in the abdomen attended with diarrhœa. The abdomen on examination felt tense but not much enlarged, nor had he any feverish symptoms. When in the workshop, he used to lean against the bench, pressing his stomach hard against it, which, he said,

afforded him great relief. Medicines of an astringent nature were first prescribed, which seemed for a time to be of service, but the diarrhœa ere long increased, extreme emaciation took place, and a hard circumscribed tumour was discovered on one side of the abdomen, which, from the thinness of the abdominal parietes, Mr. COULTATE could distinctly feel was an alvine concretion. Clysters were then administered, castor oil given, and the abdomen ordered to be rubbed with oil, under the idea of pushing the concretions forward, but in vain; the patient daily became more and more emaciated, and after about three months attendance he died, on the 6th of May, completely worn out. His appetite was good, or rather almost voracious, even to within a very short time of his death. He always felt himself worse after meals. His stools, especially for some weeks before he expired, were like blood and water. He was confined to his bed for about three weeks before he died. On opening the body, the concretions were found lodged in the arch of the colon, three closely compacted together, rather high up on the left side, the fourth considerably lower, approaching the termination of the colon. The coats of the intestine were much thickened and formed into a sort of pouch, where the concretions lay. The peritoneum was but little inflamed, the other viscera were healthy. The concretion which lay by itself was sawed asunder by Mr. COULTATE, and contained a plum stone in the centre. The body was opened in the presence of the friends of the poor boy, and under circumstances which, unfortunately, prevented Mr. COULTATE from making so minute an examination as he could have wished, and from pressure of business and other unavoidable interruptions, he did not at

the time note down all the particulars of the case; but on referring to the prescriptions, he says that it does not appear that CHAMBERS ever took the smallest quantity of calcined magnesia or its carbonate, during the whole of his attendance. He had frequent doses of sulphate of magnesia, castor oil, and rhubarb; and during the latter period of his illness opium was often administered. CHAMBERS's usual diet was milk porridge twice a day, viz. at breakfast and supper; the milk thickened with oatmeal His dinner commonly consisted of meat and potatoes; he rarely took any other kind of vegetable, and always ate oat cake at his dinner. In the afternoon he ate oat bread, and cheese, and drank beer; so that he never took a single repast without oatmeal in some shape or other. During his illness he occasionally had oatmeal gruel, and sometimes a little beef or mutton broth, into which it is usual in Lancashire to throw, whilst preparing it, a spoonful or two of oatmeal. He was also requested at this period, to live a good deal on milk and vegetables.

Mr. COULTATE adds, in his letter to Mr. THOMSON, that during the time he acted as assistant to Mr. BARLOW of Blackburn, a case similar to that of CHAMBERS's came under his care. The patient was a girl about fourteen years of age. The concretion had made its way down to the rectum, and was extracted by the forceps. It was about the size of a hen's egg, but appeared of a firmer texture, and felt heavier than those taken from CHAMBERS. The nucleus of this calculus was also a plum stone. The girl recovered; and Mr. COULTATE frequently saw her afterwards.

Another case also occurred in the course of Mr. BARLOW's practice in which eight similar concretions (the two largest

about the size of a hen's egg, the others much smaller) were extracted from the rectum of a boy in the neighbourhood of Blackburn. By the liberality of Messrs. COULTATE and BARLOW, the whole are now deposited in the Museum of the Royal College of Surgeons.

The concretions are of a light brown colour; the external coating is in parts firm and compact, and generally pretty smooth, and consists chiefly of a mixture of phosphate of lime and ammoniaco-magnesian phosphate. In other places the surface has a velvety feel and is composed of very fine fibres closely matted or felted together, and in some places these fibres are collected into considerable masses, as may be particularly seen in the cross section of the remaining half of the one selected for chemical examination. The husk of an oat was imbedded in the surface of the calculus which had been sawed asunder before I received it. Their general structure is laminated, and consists of concentric alternating layers of the fibrous substance and the phosphates. The external form of the concretions is various; three of them have assumed very solid figures, whilst the middle one of the three that were found lying together, is much flattened by the pressure of the outer ones. Their total weight, in the state in which I received them, was 2273½ grains, or about 4¾ ounces.

The largest weighed 1036 grains.
The smallest - - 511¼

They have all a very fetid disgusting smell. I found the specific gravity of the largest calculus at 60°, to be 1.875. At first it floated in distilled water with nearly a fourth of its bulk above the surface, but after the air which filled its pores had been extricated, by placing it immersed in water

under an exhausted receiver, it sunk readily in that fluid. The calculus selected by Sir EVERARD HOME for analysis, was divided by him, and the plum stone nucleus cut through as in the other. The unequal distribution of their component parts, renders it impossible that the results of any two analyses should agree very accurately in the relative proportions of the several ingredients of the concretions; there is no difficulty, however, in ascertaining their nature. They consist of phosphate of lime and ammoniaco-magnesian phosphate, the former in very much the largest proportion; of a large portion of animal matter, principally gelatine; a small portion of resin, and a fine fibrous vegetable substance, from the inner coat enveloping the farina of the oat, which, when the outer husk is removed, is seen to consist of a number of delicate fibres arranged longitudinally round the farina. I did not discover any fatty matter, either by the action of boiling water or a weak alkaline solution, nor any of the substances usually found in urinary calculi, except the phosphates already mentioned.

The method I adopted for the chemical examination of the calculus, was, by submitting it successively, (1) to the action of cold water; (2) of boiling water; (3) of alcohol; (4) of a dilute solution of caustic soda; and (5), of muriatic acid. The cold aqueous infusion exhibited no decided trace of albumen, either on being boiled, or by the test of corrosive sublimate. Sulphate of silver, muriate of baryta, and oxalate of ammonia rendered it slightly turbid. By the second and fourth processes I obtained animal matter, consisting chiefly of gelatine. Its solution in water passed very slowly through the filter whilst cold, more readily when hot. It was not

soluble in alcohol, gave no precipitate with solution of corrosive sublimate, but an abundant white one with infusion of galls. The solution by caustic soda (4), neutralized by weak acetic acid, gave also an abundant precipitate with infusion of galls, and none with corrosive sublimate. It was darker coloured than that obtained by water alone. In the third process, alcohol dissolved a small portion of resin, which water precipitated again perfectly white.

The muriatic acid dissolved the phosphates, and left the vegetable fibre.

To ascertain the relative quantities of the two phosphates, I destroyed the animal and vegetable matter of a fresh portion of the calculus by burning, dissolved the phosphates in muriatic acid, and precipitated them together by ammonia; I then digested the precipitate, whilst moist, in oxalic acid, filtered, and threw down the triple phosphate by ammonia, adding also a little phosphate of soda to secure the precipitation of the whole of the magnesia. The oxalate of lime was then decomposed by heat, its base re-dissolved in muriatic acid, and precipitated by sub-carbonate of ammonia, and the quantity of phosphate of lime inferred from that of the carbonate obtained. The proportions of the several ingredients of the calculus were as follows:

2, 4	Animal matter, chiefly gelatine	25 . 20
3.	Resin - - - -	3 . 90
5	Ammoniaco-magnesian phosphate	5 . 16
	Phosphate of lime - - -	45 . 34
6.	Vegetable fibre - - -	20 . 30
		99 . 90

I must not conclude this communication without referring to other similar alvine concretions, which have been at different times met with in those parts of the country where oatmeal is in common use as an article of food among the poorer classes. Dr. MARCET, in his Essay on Calculous Disorders, mentions a concretion which was showed to him by Dr. BOSTOCK, that had been voided by a labouring man in Lancashire; and Dr. MARCET himself examined another given him by Mr. SILVIERA, who had it from Dr. MONRO of Edinburgh. It was in the examination of this calculus, that the true nature of the velvety fibrous substance was ascertained by Dr. WOLLASTON, who, Dr. MARCET says, "found it to consist of extremely mi-"nute vegetable fibres, or short needles, pointed at both ends; "which he immediately conjectured to arise from some kind "of food peculiar to Scotland. For some time, however, he "failed in his attempts to trace this substance to its origin. "But the ingenious Mr. CLIFT, of the College of Surgeons, "to whom the subject was mentioned in conversation, having "put the question, 'whether this fibrous substance might not "'proceed from oats,' Dr. WOLLASTON was induced to ex-"amine the structure of this seed; and the result fully "verified Mr. CLIFT's conjecture." (p. 139).

In Dr. ALEXANDER MUNRO's Morbid Anatomy of the Gullet, mention is made of forty-two alvine concretions collected by the Author's father, which were examined by Dr. THOMSON. Their structure, (with one exception similar in all) is described by Dr. MONRO (p. 32) "as more or less "porous, and somewhat like to dried sponge, and when ex-"amined by the aid of a magnifying glass, seems to be made "up of a number of very small fibres intimately interwoven

" with each other, like those in a hat, or in chamois leather; " and the interstices between the fibres are filled up with " earthy matter." And at p. 34 he adds, " in the centre of " the concretion, a *prune, or a cherry stone*, or a small piece of " bone, or a biliary calculus, is generally found."

Dr. THOMSON states the average specific gravity of these concretions to be 1.4. The one I weighed was, as mentioned above, considerably heavier. This may be owing to one containing more of the fibrous substance than the other, or to Dr. THOMSON not having employed an exhausted vessel to extricate the air from the pores of the calculus. Dr. THOMSON obtained from his analysis, albumen, common salts, phosphate of lime, phosphate of soda and the oat fibres, which he describes as " undoubtedly of a peculiar nature, dif- " fering from every animal and vegetable substance hitherto " examined." My results, in most respects, agree with Dr. THOMSON's, except that I could not discover any albumen; and on the other hand, the calculi examined by him, do not appear to have contained either the ammoniaco-magnesian phosphate or gelatine.